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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,149	10/31/2003	Michael Factor	IL920030026US1	1475

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EXAMINER	
KRAVETS, LEONID	

ART UNIT	PAPER NUMBER
2189	

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/699,149	FACTOR ET AL.	
	Examiner	Art Unit	
	Leonid Kravets	2189	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *13 and 16* is/are allowed.

6)☒ Claim(s) *1-12,14 and 15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 4 and 9 are rejected under 35 U.S.C. 112, second paragraph because block user data is described as part of the block header in the claim; however, in the specification the block user data is described as separate from the header. Examiner interprets the block user data to be separate from the header.

Claim Rejections - 35 USC § 103

2. Claims 1-5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howard (US Patent 6,694,318), and further in view of Wilcox (US Patent 5,568,639), Bodnar (US Patent 6,012,063) and Jiang (US PGPUB 2003/0191745). 12/2/05

As per claim 1, Wilcox, Howard, Bodnar and Jiang disclose a method for managing variable sized pages [Howard discloses variable length files consisting of blocks (Fig 2)] of possibly non contiguous blocks in a Non-Volatile-Storage (NVS) for attaining a consistent NVS image that survives malfunction events (Wilcox, Col 9, Lines 57-59); each page includes a self describing block or a linked list of self describing blocks [The blocks within each file are either allocated or free and are connected through pointers, thus self describing (Fig2)], the method comprising:

(a) providing auxiliary modules stored in Volatile Storage [While Howard discloses a free block list, he does not specify it is held in volatile memory. Jiang discloses storing a list of free blocks in cache (Fig 5, Ref 144)];

(b) providing an atomic "create a new page" procedure [Wilcox discloses creating containers (Col 4, Lines 15-16) that store data objects (blocks). Howard discloses that blocks are allocated and deleted by the file system as files are created (Col, Lines 53-54). Since the blocks are chained for the independent file, a new chain (page) must be created]. Wilcox further provides that such a procedure can be atomic (Col 9, Lines 20-24)];

(c) providing an atomic "add block" procedure for adding a possibly non contiguous block to a page; the newly added block has a back pointer to a previous block in the page [Blocks are allocated to the chain of each file in Howard (Col 6, Lines 13-17). Howard uses forward pointers, however Bodnar discloses each block having a backward pointer (Col 5, Lines 13-14). Wilcox further provides that this procedure can be atomic (Col 9, Lines 20-24)];

(d) providing a "delete page" procedure for deleting all blocks in a page [When a file is deleted, all the blocks are deallocated to the free list (Howard, Col 4, Lines 53-54)];

(e) providing at least one recovery procedure for rolling backward said add block procedure and rolling forward the delete page procedure, in case of malfunction event, thereby attaining consistent NVS [Wilcox describes using a journal to track changes

which can then be rolled forward or rolled backward in case of a malfunction (Col 5, Lines 43-45)].

As per claim 2, Wilcox, Howard, Bodnar and Jiang disclose the method according to claim 1, wherein said auxiliary modules comprise free block database indicative of free blocks and association database representing replica of linked lists and partial linked lists, if any, of blocks in the NVS [Jiang discloses a database indicative of free blocks and database of allocated blocks stored in cache. Since the pages are linked lists of blocks, the database of allocated blocks represents such a replica (Fig 5, Ref 144, 146)].

As per claim 3, Wilcox, Howard, Bodnar and Jiang disclose the method according to claim 1, wherein said malfunction event being an electricity power malfunction [An electricity power malfunction is inherently a malfunction event].

As per claim 4, Wilcox, Howard, Bodnar and Jiang disclose the method according to claim 1, Bodnar further discloses the method wherein each block has the following data structure:

Block header that includes:

Block state: storing any of `free`; `used`; `used-chained` values (Fig 3, Ref 310);

Entity identifier: storing entity identifier and applicable if state is not

`free`(Fig 3, Ref 310);

Previous pointer: storing pointer to previous block in chain and applicable if state is `used-chained` (Fig 3, Ref 320);

Block user data: storing data that pertains to protected entity (Fig 3, Ref 350).

As per claim 5, Wilcox, Howard, Bodnar and Jiang disclose the method according to claim 2, wherein said "add block" procedure comprises: applying atomic write that includes adding a block with a backward pointer to a previous block in the linked list of the page [In Howard, a block is allocated (written) to the linked-list that constitutes a file, these linked-lists have forward pointers; however, Bodnar discloses blocks having backward pointers). Wilcox further provides that this procedure can be atomic (Col 9, Lines 20-24)].

As per claim 14, Wilcox, Howard, Bodnar and Jiang the method according to claim 1, Jiang further discloses the method for use in file systems that store meta-data on disk(s) (Fig 2, Ref 42).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the journaling of Wilcox into the system of Howard, since Howard and Wilcox form the same field of endeavor, namely data storage

structures and this would allow for recovery from malfunctions (Wilcox, Col 9, Lines 57-59).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the block header and backward pointers of Bodnar into the system of Howard and Wilcox, since Howard, Wilcox and Bodnar form the same field of endeavor, namely data storage structures and this would allow for a more organized structure within the blocks.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the auxiliary structures of Jiang into the system of Howard, Wilcox and Bodnar, since Howard, Wilcox, Bodnar and Jiang form the same field of endeavor, namely data storage structures and this would allow for a central database of all allocated and deallocated blocks.

3. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Howard (US Patent 6,694,318), and further in view of Wilcox (US Patent 5,568,639), Bodnar (US Patent 6,012,063) and Jiang (US PGPUB 2003/0191745).

As per claim 7, Wilcox, Howard and Bodnar disclose a Non-Volatile-Storage (NVS) that includes variable sized pages [Howard discloses variable length files

consisting of blocks (Fig 2)] of possibly non contiguous blocks; each page includes a self describing block or linked list of self describing blocks [The blocks within each file are either allocated or free and are connected through pointers, thus self describing (Fig2)], using backward pointing scheme [Bodnar discloses blocks having backward pointers (Col 5, Lines 13-14)]; said NVS is not susceptible to inconsistency in response to "create a new page", "add block to a page", or "delete blocks in a page" operations [Howard anticipates these operations by providing for allocating and deleting of blocks based on creation, destroying and resize of files (Col 4, Lines 53-54)], irrespective of any intervening malfunction event Wilcox, (Col 9, Lines 57-59) .

As per claim 8, Wilcox, Howard and Bodnar disclose the NVS according to claim 7, wherein said malfunction event being an electricity power malfunction [An electricity power malfunction is inherently a malfunction event].

As per claim 9, Wilcox, Howard and Bodnar disclose the NVS according to claim 7, wherein each block has the following data structure:

Block header that includes:

Block state: storing any of `free`; `used`; `used-chained` values (Fig 3, Ref 310);

Entity identifier: storing entity identifier and applicable if state is not `free`(Fig 3, Ref 310);

Previous pointer: storing pointer to previous block in chain and applicable

if state is `used-chained` (Fig 3, Ref 320);

Block user data: storing data that pertains to protected entity (Fig 3, Ref 350).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the journaling of Wilcox into the system of Howard, since Howard and Wilcox form the same field of endeavor, namely data storage structures and this would allow for recovery from malfunctions (Wilcox, Col 9, Lines 57-59).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the block header and backward pointers of Bodnar into the system of Howard and Wilcox, since Howard, Wilcox and Bodnar form the same field of endeavor, namely data storage structures and this would allow for a more organized structure within the blocks.

4. Claims 10-11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Howard (US Patent 6,694,318) in view of Wilcox (US Patent 5,568,639) and Bodnar (US Patent 6,012,063) as applied to claim 7 above and further in view of Jiang (US PGPUB 2003/0191745).

As per claim 10, Wilcox, Howard and Bodnar disclose the NVS according to claim 7. Jiang further discloses such a system having associated auxiliary modules stored in Volatile storage; the auxiliary modules comprise free block database indicative of free blocks and association database representing replica of linked lists and partial linked lists, if any, of blocks in the NVS [Jiang discloses a database indicative of free blocks and database of allocated blocks stored in cache. Since the pages are linked lists of blocks, the database of allocated blocks represents such a replica (Fig 5, Ref 144, 146)].

As per claim 11, Wilcox, Howard and Bodnar and Jiang disclose the NVS according to claim 10, wherein said "add block" procedure comprises: applying atomic write that includes: adding a block with a backward pointer to a previous block in the linked list of the page [In Howard, a block is allocated (written) to the linked-list that constitutes a file, these linked-lists have forward pointers; however, Bodnar discloses blocks having backward pointers). Wilcox further provides that this procedure can be atomic (Col 9, Lines 20-24)].

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the auxiliary structures of Jiang into the system of Howard, Wilcox and Bodnar, since Howard, Wilcox, Bodnar and Jiang form the same field of endeavor, namely data storage structures and this would allow for a central database of all allocated and deallocated blocks.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Howard (US Patent 6,694,318) in view of Wilcox (US Patent 5,568,639) and Bodnar (US Patent 6,012,063) as applied to claim 7 above and further in view of Jiang (US PGPUB 2003/0191745).

As per claim 15, Wilcox, Howard and Bodnar disclose the Non-Volatile-Storage (NVS) according to claim 7, Jiang further discloses the method for use in file systems that store meta-data on disk(s) (Fig 2, Ref 42).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the use of this method for systems that store meta-data on disk(s) of Jiang into the system of Wilcox, Howard and Bodnar since Wilcox, Howard and Bodnar and Jiang form the same field of endeavor, namely data storage structures and this would allow for dividing tasks between several processors (Jiang, abstract).

Allowable Subject Matter

6. Claims 6 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claim 13 and 16 are allowed.

Conclusion

8. The following is text cited from 37 CFR 1.111(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonid Kravets whose telephone number is 571-272-2706. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached at 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Leonid Kravets
Patent Examiner
Art Unit 2189

November 30, 2005

MATTHEW KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER